



382.1019

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Box Seq**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Re: Application of: February 28, 2006

Patent No.: 7,005,415

Serial No.: 09/121,017

Issued: February 28, 2006

Filed: July 22, 1998

For: **HEPARIN-BINDING PROTEINS MODIFIED WITH  
SUGAR CHAINS, METHOD OF PRODUCING THE  
SAME AND PHARMACEUTICAL COMPOSITIONS  
CONTAINING THE SAME**

Art Unit: 1644

ATTN: Certificate of Correction Branch  
Commissioner for Patents  
P.O. Box 1450  
Arlington, VA 22313-1450

November 21, 2006

**Certificate  
NOV 30 2006  
of Correction****REQUEST FOR CORRECTED PATENT DEED UNDER 37 C.F.R. § 1.322**

S I R:

In accordance with 37 C.F.R. §1.322, Applicant hereby requests that the U.S. Patent and Trademark Office issue a corrected Patent Deed for the above-identified U.S. patent correcting an error in the sequence listing as issued in this patent. Enclosed is a Form PTO-1050 showing the error in this patent, namely an incorrect sequence listing, and an attachment providing the correct sequence listing as provided to the USPTO, along with a disk containing the sequence listing in computer-readable format for the convenience of the USPTO.

This application was filed on July 22, 1998. On June 27, 2000, in response to a request by the USPTO, Applicants filed a revised sequence listing in paper form and in computer-readable format (CRF). As shown on the attached USPTO PAIR system image file wrapper printout, a 46-page sequence listing was filed in paper form on June 27, 2000 and this CRF was accepted by the USPTO on August 14, 2000 (see pp. 4-5). In fact, as shown on the attached USPTO PAIR system transaction history printout, the CRF was considered to be "Good

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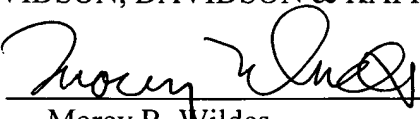
Technically” and “Entered into Database” on July 31, 2000 (see p. 2). Subsequent to those dates, there was no further reference to or correspondence between Applicants and the USPTO regarding the sequence listing, either its paper form or its CRF.

However, the sequence listing that was published in U.S. Patent No. 7,005,415 is NOT the sequence listing as provided by Applicants on July 27, 2000. For one thing, the published sequence listing contains 105 gene sequences, but the sequence listing as provided by Applicants on July 27, 2000 contained only 31 gene sequences. Moreover, a cursory review shows that the subject matters of the sequence listing published in U.S. Patent No. 7,005,415 is quite different from the sequence listing as provided by Applicants on July 27, 2000. Accordingly, Applicants request that U.S. Patent No. 7,005,415 be corrected to publish the correct sequence listing.

In lieu of a Certificate of Correction under 37 C.F.R. § 1.322(a), Applicants hereby request that the Commissioner for Patents issue a corrected Patent Deed for this patent under 37 C.F.R. § 1.322(b) on the grounds that the nature of the USPTO’s mistake is such that a certificate of correction not appropriate in form. In particular, the sequence listing appears on 44 of the 60 pages of the patent, and mere issuance of a certificate of correction for this massive amount of misinformation would not properly correct the text of the patent.

As set forth above, this error is believed to be the fault of the USPTO, and, as such, no fee for issuance of a Certificate of Correction or a corrected Patent Deed is due under 37 C.F.R. § 1.322(b). If any fees are deemed to be due in connection with this Request, the Commissioner is authorized to charge payment to Deposit Account No. 50-0552.

Respectfully Submitted,  
DAVIDSON, DAVIDSON & KAPPEL, LLC

By:   
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Reg. No. 36,968

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New York, New York 10018  
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09/121,017

HEPARIN-BINDING PROTEINS MODIFIED WITH SUGAR CHAINS, ME  
THE SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING T

Application Data	Transaction History	Image File Wrapper	Patent Term Extension History	Continuity Data	Foreign Priority	Published Documents	Fe
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This application is officially maintained in electronic form. To View: Click the desired Document. To Print: Check the desired document(s) and click StartDownload.

Mail Room Date	Document Description	Page Count	
12-16-2005	<a href="#">Issue Fee Payment (PTO-85B)</a>	1	
10-12-2005	<a href="#">Notice of Allowance and Fees Due (PTOL-85)</a>	3	
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10-12-2005	<a href="#">Issue Information including classification, examiner, name, claim, renumbering, etc.</a>	1	
10-12-2005	<a href="#">Amendment After Final or under 37CFR 1.312, initialed by the examiner.</a>	1	
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09-07-2004	<u>Applicant Arguments/Remarks Made in an Amendment</u>	8
09-07-2004	<u>Extension of Time</u>	1
09-07-2004	<u>Authorization for Extension of Time all replies</u>	1
09-07-2004	<u>Information Disclosure Statement (IDS) Filed</u>	3
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05-03-2004	<u>Extension of Time</u>	1
05-03-2004	<u>Notice of Appeal Filed</u>	1
05-03-2004	<u>Transmittal to TC</u>	2
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03-29-2002	<u>Foreign Reference</u>	21
03-29-2002	<u>Certified Copy of Foreign Priority Application</u>	95
03-29-2002	<u>Foreign Reference</u>	79
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01-25-2002	<u>Transmittal to TC</u>	1
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11-15-2001	<u>Miscellaneous Action with SSP</u>	2
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10-18-2001	<u>Transmittal to TC</u>	1
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04-05-2001	<u>Transmittal to TC</u>	1
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10-03-2000	<u>Requirement for Restriction/Election</u>	6
10-03-2000	<u>List of references cited by examiner</u>	1
09-06-2000	<u>Examiner's search strategy and results</u>	32
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07-14-2000	<u>CRF Sequence Listing Filed</u>	6
06-27-2000	<u>Transmittal to TC</u>	1
06-27-2000	<u>Amendment - After Non-Final Rejection</u>	1

06-27-2000	<u>Applicant Arguments/Remarks Made in an Amendment</u>	1
06-27-2000	<u>Sequence Listing</u>	46
05-23-2000	<u>Miscellaneous Action with SSP</u>	2
05-23-2000	<u>CRF Sequence Listing Filed</u>	3
03-20-2000	<u>Transmittal to TC</u>	1
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03-20-2000	<u>Applicant Arguments/Remarks Made in an Amendment</u>	1
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02-17-2000	<u>CRF Sequence Listing Filed</u>	1
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08-04-1999	<u>Notice of Formal Drawings Required</u>	1
01-25-1999	<u>Request for Corrected Filing Receipt</u>	2
11-23-1998	<u>Certified Copy of Foreign Priority Application</u>	62
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11-20-1998	<u>Drawings</u>	9
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09-28-1998	<a href="#">Request for Corrected Filing Receipt</a>	2
08-18-1998	<a href="#">Miscellaneous Action with SSP</a>	1
07-22-1998	<a href="#">Issue Information including classification, examiner, name, claim, renumbering, etc.</a>	1
07-22-1998	<a href="#">Search information including classification, databases and other search related notes</a>	1
07-22-1998	<a href="#">Index of Claims</a>	1
07-22-1998	<a href="#">Transmittal of New Application</a>	5
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07-22-1998	<a href="#">Specification - Not in English</a>	44
07-22-1998	<a href="#">Fee Worksheet (PTO-06)</a>	2
07-22-1998	<a href="#">Claims Worksheet (PTO-2022)</a>	1
07-22-1998	<a href="#">Miscellaneous Incoming Letter</a>	58

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Application Data	Transaction History	Image File Wrapper	Patent Term Extension History	Continuity Data	Foreign Priority	Published Documents	Fe
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## Transaction History

Date	Transaction Description
03-02-2006	Sequence Moved to Public Database
02-28-2006	Recordation of Patent Grant Mailed
02-08-2006	Issue Notification Mailed
02-28-2006	Patent Issue Date Used in PTA Calculation
01-13-2006	Dispatch to FDC
01-05-2006	Sequence Forwarded to Pubs on Tape
12-28-2005	Application Is Considered Ready for Issue
12-16-2005	Issue Fee Payment Verified
12-16-2005	Issue Fee Payment Received
10-12-2005	Mail Notice of Allowance
09-30-2005	Notice of Allowance Data Verification Completed
09-30-2005	Case Docketed to Examiner in GAU
09-26-2005	Date Forwarded to Examiner
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07-19-2005	Mail Final Rejection (PTOL - 326)
06-20-2005	Final Rejection
04-25-2005	Date Forwarded to Examiner
04-13-2005	Response after Non-Final Action
04-25-2005	IFW TSS Processing by Tech Center Complete
09-07-2004	Reference capture on IDS
03-29-2002	Reference capture on IDS
03-29-2002	Affidavit(s) (Rule 131 or 132) or Exhibit(s) Received
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09-07-2004	Information Disclosure Statement (IDS) Filed
09-14-2004	Date Forwarded to Examiner
09-07-2004	Request for Continued Examination (RCE)

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09-14-2004	DISPOSAL FOR A RCE/CPA/129 (express abandonment if CPA)
09-07-2004	Request for Extension of Time - Granted
09-07-2004	Workflow incoming amendment IFW
05-03-2004	Notice of Appeal Filed
05-03-2004	Request for Extension of Time - Granted
11-03-2003	Mail Final Rejection (PTOL - 326)
10-14-2003	Final Rejection
08-06-2003	Date Forwarded to Examiner
07-24-2003	Response after Non-Final Action
07-03-2003	Mail Notice of Informal or Non-Responsive Amendment
05-21-2003	Date Forwarded to Examiner
05-15-2003	Informal or Non-Responsive Amendment after Examiner Action
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05-15-2003	Request for Extension of Time - Granted
11-13-2002	Mail Non-Final Rejection
11-01-2002	Non-Final Rejection
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04-04-2002	Date Forwarded to Examiner
03-29-2002	Request for Continued Examination (RCE)
04-04-2002	DISPOSAL FOR A RCE/CPA/129 (express abandonment if CPA)
03-29-2002	Workflow - Request for RCE - Begin
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12-18-2001	Notice of Appeal Filed
11-15-2001	Mail Advisory Action (PTOL - 303)
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10-23-2001	Date Forwarded to Examiner
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10-18-2001	Request for Extension of Time - Granted
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03-08-2001	Response after Non-Final Action
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10-03-2000	Mail Non-Final Rejection
09-11-2000	Non-Final Rejection
07-31-2000	CRF Is Good Technically / Entered into Database
07-05-2000	Date Forwarded to Examiner
06-27-2000	Response after Non-Final Action
05-23-2000	Mail Notice of Informal or Non-Responsive Amendment

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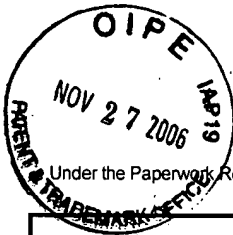
04-20-2000	CRF Does Not Match Application Specification -- Applicant Must Corr
03-25-2000	CRF Disk Has Been Received by Preexam / Group / PCT
03-25-2000	Date Forwarded to Examiner
03-20-2000	Informal or Non-Responsive Amendment after Examiner Action
02-17-2000	Mail Notice of Informal or Non-Responsive Amendment
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12-17-1999	CRF Disk Has Been Received by Preexam / Group / PCT
08-04-1999	Mail Restriction Requirement
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11-23-1998	Affidavit(s) (Rule 131 or 132) or Exhibit(s) Received
05-04-1999	Preexamination Location Change
11-23-1998	Request for Foreign Priority (Priority Papers May Be Included)
01-30-1999	Case Docketed to Examiner in GAU
01-11-1999	Application Dispatched from OIPE
12-02-1998	Application Is Now Complete
08-18-1998	Notice Mailed--Application Incomplete--Filing Date Assigned
08-04-1998	IFW Scan & PACR Auto Security Review
07-24-1998	Initial Exam Team nn

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,005,415

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APPLICATION NO.: 09/121,017

ISSUE DATE : February 28, 2006

INVENTOR(S) : February 28, 2006

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

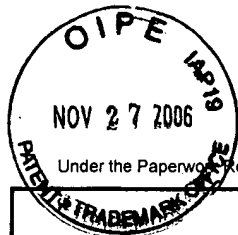
Please replace the sequence listing as published (at columns 13-100) in this patent with the sequence listing attached hereto.

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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DEC 01 2006



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Signature

Morey B. Wildes

\_\_\_\_\_  
Typed or printed name of person signing Certificate

36,968

Registration Number, if applicable

212-736-1940

Telephone Number

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

Re.: Docket No.: 382.1019

Applicant(s): IMAMURA et al.

Serial No.: 09/121,017 (U.S. Patent No. 7,005,415)

Invention: HEPARIN-BINDING PROTEINS MODIFIED WITH SUGAR CHAINS, METHOD OF PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Filing Date: July 22, 1998 (Issued February 28, 2006)

- REQUEST FOR CORRECTED PATENT DEED UNDER 37 C.F.R. § 1.322 (2 pages);
- copies of USPTO PAIR system image file wrapper and transaction history printouts (9 pages);
- Form PTO/SB/44 (Certificate of Correction);
- paper copy of sequence listing (46 pages); and
- 1 disk with computer-readable form of sequence listing

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SEQUENCE LISTING

<110> Imamura, Toru

Asada, Masahiro

Oka, Syuichi

Suzuki, Masashi

Yoneda, Atsuko

Ota, Keiko

Oda, Yuko

Miyakawa, Kazuko

Orikasa, Noriko

Asada, Chie

Kojima, Tetsuhito

<120> HEPARIN-BINDING PROTEINS MODIFIED WITH SUGAR CHAINS,  
METHOD OF PRODUCING THE SAME AND PHARMACEUTICAL  
COMPOSITIONS CONTAINING THE SAME

<130> 382.1019

<140> 09/121,017

<141> 1998-07-22

<150> 307721/1997

<151> 1997-11-10

<160> 31

<170> PatentIn Ver. 2.0

<210> 1

<211> 221

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human rydocan and a part of human  
fibroblast

growth factor 1

<400> 1

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35

40

45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His

65

70

75

80

Pro Leu Val Pro Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr

85

90

95

Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val

100

105

110

Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser

115

120

125

Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln

130

135

140

Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro

145

150

155

160

Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn

165

170

175

Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu

180

185

190

Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln

195

200

205

Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

210

215

220

<210> 2

<211> 663

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of



sequence for a part of human rydocan and a part of human  
fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(663)

<400> 2

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Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35

40

45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

gat ctg gat gac ttg gaa gac tcc atg atc ggc cct gaa gtt gtc cat 240

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His

65

70

75

80

ccc ttg gtg cct cta gat gct aat tac aag aag ccc aaa ctc ctc tac 288

Pro Leu Val Pro Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr

85

90

95

tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc aca gtg 336

Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val

100

105

110

gat ggg aca agg gac agg agc gac cag cac att cag ctg cag ctc agt 384

Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser

115

120

125

gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act ggc cag 432

Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln

130

135

140

tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag aca cca 480

Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro

145

150

155

160

aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat tac aac 528

Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn

165

170

175

acc tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt ggc ctc 576

Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu

180

185

190

aag aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat ggc cag 624

Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln

195

200

205

aaa gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 663

Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

210

215

220

<210> 3

<211> 175

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of mouse fibroblast growth factor 6 and  
a part of human fibroblast growth factor 1

<400> 3

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1

5

10

15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20

25

30

Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35

40

45

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50

55

60

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65

70

75

80

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85

90

95

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100

105

110

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His

115

120

125

Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val

130

135

140

Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr

145

150

155

160

Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

165

170

175

<210> 4

<211> 525

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of mouse fibroblast growth factor 6 and  
a part of human fibroblast growth factor 1

<220>

<221> CDS

<222> (1)..(525)

<400> 4

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1 5 10 15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20 25 30

cgc gcc aac ggc acg cta ctg gac gct aat tac aag aag ccc aaa ctc 144

Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35 40 45

ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc 192

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50 55 60

aca gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag 240

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65 70 75 80

ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act 288

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85 90 95

ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag 336

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100 105 110

aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat 384

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His

115

120

125

tac aac acc tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt 432

Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val

130

135

140

ggc ctc aag aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat 480

Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr

145

150

155

160

ggc cag aaa gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 525

Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

165

170

175

<210> 5

<211> 181

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of mouse fibroblast growth factor 6,

a part of human fibroblast growth factor 1 and an artificial  
sequence

<400> 5

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1

5

10

15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20

25

30

Arg Ala Gln Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35

40

45

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50

55

60

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65

70

75

80

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85

90

95

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100

105

110

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Ala Ala

115

120

125

Thr Pro Ala Pro Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala

130

135

140

Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg

145

150

155

160

Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu

165

170

175

Pro Val Ser Ser Asp

180

&lt;210&gt; 6

&lt;211&gt; 543

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: fusion of

sequence for a part of mouse fibroblast growth factor 6,

a part of human fibroblast growth factor 1 and an artificial

sequence

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(543)

&lt;400&gt; 6

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1

5

10

15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20

25

30

cgc gcc caa ggc acg cta ctg gac gct aat tac aag aag ccc aaa ctc 144



Arg Ala Gln Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35

40

45

ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc 192

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50

55

60

aca gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag 240

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65

70

75

80

ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act 288

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85

90

95

ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag 336

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100

105

110

aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag gct gct 384

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Ala Ala

115

120

125

act cca gct cca aac cat tac aac acc tat ata tcc aag aag cat gca 432

Thr Pro Ala Pro Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala

130

135

140

gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc tgc aaa cgc 480

Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg

145

150

155

160

ggt cct cgg act cac tat ggc cag aaa gca atc ttg ttt ctc ccc ctg 528

Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu

165

170

175

cca gtc tct tct gat

543

Pro Val Ser Ser Asp

180

<210> 7

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 7

ttgtcgaccc accatggccc ccgcccgtct

30

<210> 8

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 8

ttgatatcta gaggcaccaa gggatg

26

<210> 9

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 9

gcgtcgacag cgctaattac aagaagccca aactc

35

<210> 10

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 10

ccgaattcga attctttaat cagaagagac tgg

33

<210> 11

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 11

gcgtcgaccc accatgtccc ggggagcagg acgtgttcag ggcacgctgc aggctctcgt 60

cttc

64

<210> 12

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 12

gcgatatcca gtagcgtgcc gttggcgcg

29

<210> 13

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 13

gcgtcgaccc accatgtc

18

<210> 14

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 14

gcgatatcca gtagcgtgcc ttgggcgcg

29

<210> 15

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 15

gctggaggag gctgctactc cagctccaaa ccattaca

38

<210> 16

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for PCR

<400> 16

gccgctctag aactagtgga t

21

<210> 17

<211> 200

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human  
fibroblast

growth factor 1

<400> 17

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35

40

45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly

65

70

75

80

His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp

85

90

95

Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly

100

105

110

Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp

115

120

125

Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu

130

135

140

Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys

145

150

155

160

Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser

165

170

175

Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe

180

185

190

Leu Pro Leu Pro Val Ser Ser Asp

195

200

<210> 18

<211> 600

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(600)

<400> 18

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35

40

45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60



gat gct aat tac aag aag ccc aaa ctc ctc tac tgt agc aac ggg ggc 240

Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly

65

70

75

80

cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat ggg aca agg gac 288

His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp

85

90

95

agg agc gac cag cac att cag ctg cag ctc agt gcg gaa agc gtg ggg 336

Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly

100

105

110

gag gtg tat ata aag agt acc gag act ggc cag tac ttg gcc atg gac 384

Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp

115

120

125

acc gac ggg ctt tta tac ggc tca cag aca cca aat gag gaa tgt ttg 432

Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu

130

135

140

ttc ctg gaa agg ctg gag gag aac cat tac aac acc tat ata tcc aag 480

Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys

145

150

155

160

aag cat gca gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc 528

Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser

165

170

175

tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa gca atc ttg ttt 576

Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe

180

185

190

ctc ccc ctg cca gtc tct tct gat

600

Leu Pro Leu Pro Val Ser Ser Asp

195

200

<210> 19

<211> 200

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan mutant and a part of human  
fibroblast growth factor 1

<400> 19

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Ser Asp Asp Glu Asp Val

35

40

45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly  
65 70 75 80

His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp  
85 90 95

Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly  
100 105 110

Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp  
115 120 125

Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu  
130 135 140

Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys  
145 150 155 160

Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser  
165 170 175

Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe  
180 185 190

Leu Pro Leu Pro Val Ser Ser Asp  
195 200

<210> 20

<211> 600

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of human ryudocan mutant and a part of human  
fibroblast growth factor 1

<220>

<221> CDS

<222> (1)..(600)

<400> 20

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1 5 10 15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20 25 30

cta gaa ggc cga tac ttc tcc gga gcc cta tca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Ser Asp Asp Glu Asp Val

35 40 45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50 55 60

gat gct aat tac aag aag ccc aaa ctc ctc tac tgt agc aac ggg ggc 240

Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly

65	70	75	80	
cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat ggg aca agg gac				288
His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp				
85	90	95		
agg agc gac cag cac att cag ctg cag ctc agt gcg gaa agc gtg ggg				336
Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly				
100	105	110		
gag gtg tat ata aag agt acc gag act ggc cag tac ttg gcc atg gac				384
Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp				
115	120	125		
acc gac ggg ctt tta tac ggc tca cag aca cca aat gag gaa tgt ttg				432
Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu				
130	135	140		
ttc ctg gaa agg ctg gag gag aac cat tac aac acc tat ata tcc aag				480
Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys				
145	150	155	160	
aag cat gca gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc				528
Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser				
165	170	175		
tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa gca atc ttg ttt				576
Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe				
180	185	190		

ctc ccc ctg cca gtc tct tct gat

600

Leu Pro Leu Pro Val Ser Ser Asp

195

200

<210> 21

<211> 254

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human  
fibroblast

growth factor 1

<400> 21

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35

40

45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His

65

70

75

80

Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly

85

90

95

Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile

100

105

110

Pro Lys Arg Ile Ser Pro Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu

115

120

125

Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr

130

135

140

Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu

145

150

155

160

Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly

165

170

175

Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr

180

185

190

Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr

195

200

205

Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly

210

215

220

Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly

225

230

235

240

Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

245

250

<210> 22

<211> 762

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human  
fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(762)

<400> 22

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val



35

40

45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

gat ctg gat gac ttg gaa gac tcc atg atc ggc cct gaa gtt gtc cat 240

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His

65

70

75

80

ccc ttg gtg cct cta gat aac cat atc cct gag agg gca ggg tct ggg 288

Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly

85

90

95

agc caa gtc ccc acc gaa ccc aag aaa cta gag gag aat gag gtt atc 336

Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile

100

105

110

ccc aag aga atc tca ccc gtt gct aat tac aag aag ccc aaa ctc ctc 384

Pro Lys Arg Ile Ser Pro Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu

115

120

125

tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc aca 432

Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr

130

135

140

gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag ctc 480

Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu

145

150

155

160

agc ggc gaa agc gtg ggg gag gtg tat ata aag agt acc gag act ggc 528  
 Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly  
 165 170 175

cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag aca 576  
 Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr  
 180 185 190

cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat tac 624  
 Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr  
 195 200 205

aac acc tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt ggc 672  
 Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly  
 210 215 220

ctc aag aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat ggc 720  
 Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly  
 225 230 235 240

cag aaa gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 762  
 Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp  
 245 250

<210> 23

<211> 281

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human fibroblast

growth factor 1

<400> 23

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1 5 10 15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20 25 30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35 40 45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50 55 60

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His

65 70 75 80

Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly

85 90 95

Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile

100 105 110

Pro Lys Arg Ile Ser Pro Val Glu Glu Ser Glu Asp Val Ser Asn Lys

115 120 125

Val Ser Met Ser Ser Thr Val Gln Gly Ser Asn Ile Phe Glu Arg Thr

130 135 140

Glu Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly  
145 150 155 160

Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg  
165 170 175

Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val  
180 185 190

Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met  
195 200 205

Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys  
210 215 220

Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser  
225 230 235 240

Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly  
245 250 255

Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu  
260 265 270

Phe Leu Pro Leu Pro Val Ser Ser Asp  
275 280

<211> 843

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human  
fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(843)

<400> 24

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1

5

10

15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20

25

30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35

40

45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50

55

60

gat ctg gat gac ttg gaa gac tcc atg atc ggc cct gaa gtt gtc cat 240  
 Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His  
 65 70 75 80

ccc ttg gtg cct cta gat aac cat atc cct gag agg gca ggg tct ggg 288  
 Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly  
 85 90 95

agc caa gtc ccc acc gaa ccc aag aaa cta gag gag aat gag gtt atc 336  
 Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile  
 100 105 110

ccc aag aga atc tca ccc gtt gaa gag agt gag gat gtg tcc aac aag 384  
 Pro Lys Arg Ile Ser Pro Val Glu Glu Ser Glu Asp Val Ser Asn Lys  
 115 120 125

gtg tca atg tcc agc act gtg cag ggc agc aac atc ttt gag aga acg 432  
 Val Ser Met Ser Ser Thr Val Gln Gly Ser Asn Ile Phe Glu Arg Thr  
 130 135 140

gag gtc gct aat tac aag aag ccc aaa ctc ctc tac tgt agc aac ggg 480  
 Glu Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly  
 145 150 155 160

ggc cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat ggg aca agg 528  
 Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg  
 165 170 175

gac agg agc gac cag cac att cag ctg cag ctc agt gcg gaa agc gtg 576  
 Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val  
 180 185 190

ggg gag gtg tat ata aag agt acc gag act ggc cag tac ttg gcc atg 624

Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met

195

200

205

gac acc gac ggg ctt tta tac ggc tca cag aca cca aat gag gaa tgt 672

Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys

210

215

220

ttg ttc ctg gaa agg ctg gag gag aac cat tac aac acc tat ata tcc 720

Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser

225

230

235

240

aag aag cat gca gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg 768

Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly

245

250

255

agc tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa gca atc ttg 816

Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu

260

265

270

ttt ctc ccc ctg cca gtc tct tct gat

843

Phe Leu Pro Leu Pro Val Ser Ser Asp

275

280

<210> 25

<211> 172

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of mouse fibroblast growth factor 6 and  
a part of human fibroblast growth factor 1

<400> 25

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1 5 10 15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20 25 30

Arg Ala Asn Gly Ser Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys

35 40 45

Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp

50 55 60

Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala

65 70 75 80

Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr

85 90 95

Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn

100 105 110

Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr

115 120 125



Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys

130

135

140

Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys

145

150

155

160

Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

165

170

<210> 26

<211> 516

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of mouse fibroblast growth factor 6 and  
a part of human fibroblast growth factor 1

<220>

<221> CDS

<222> (1)..(516)

<400> 26

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1

5

10

15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20

25

30

cgc gcc aac ggc tgc gct aat tac aag aag ccc aaa ctc ctc tac tgt 144

Arg Ala Asn Gly Ser Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys

35

40

45

agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat 192

Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp

50

55

60

ggg aca agg gac agg agc gac cag cac att cag ctg cag ctc agt gcg 240

Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala

65

70

75

80

gaa agc gtg ggg gag gtg tat ata aag agt acc gag act ggc cag tac 288

Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr

85

90

95

ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag aca cca aat 336

Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn

100

105

110

gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat tac aac acc 384

Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr

115

120

125

tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt ggc ctc aag 432

Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys

130

135

140

aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa 480

Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys

145 150 155 160

gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 516

Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp

165 170

<210> 27

<211> 210

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of mouse fibroblast growth factor 6 and  
a part of human fibroblast growth 1

<400> 27

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1 5 10 15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20 25 30

Arg Ala Asn Gly Thr Leu Leu Asp Ser Arg Gly Trp Gly Thr Leu Leu

35 40 45

Ser Arg Ser Arg Ala Gly Leu Ala Gly Glu Ile Ser Gly Val Asn Trp

50

55

60

Glu Ser Gly Tyr Leu Val Gly Ile Lys Arg Gln Ala Asn Tyr Lys Lys

65

70

75

80

Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu

85

90

95

Pro Asp Gly Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile

100

105

110

Gln Leu Gln Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser

115

120

125

Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr

130

135

140

Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu

145

150

155

160

Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn

165

170

175

Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg

180

185

190

Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser

195

200

205

Ser Asp

210

<210> 28

<211> 630

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of mouse fibroblast growth factor 6 and  
a part of human fibroblast growth 1

<220>

<221> CDS

<222> (1)..(630)

<400> 28

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1

5

10

15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20

25

30

cgc gcc aac ggc acg cta ctg gac tcc aga ggc tgg ggc acc ctc ttg 144

Arg Ala Asn Gly Thr Leu Leu Asp Ser Arg Gly Trp Gly Thr Leu Leu

35

40

45

tcc agg tct cga gct ggg cta gct gga gag att tcg ggt gtg aat tgg 192

Ser Arg Ser Arg Ala Gly Leu Ala Gly Glu Ile Ser Gly Val Asn Trp

50

55

60

gaa agc ggc tat ttg gtg ggc att aag cga cag gct aat tac aag aag 240

Glu Ser Gly Tyr Leu Val Gly Ile Lys Arg Gln Ala Asn Tyr Lys Lys

65

70

75

80

ccc aaa ctc ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt 288

Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu

85

90

95

ccg gat ggc aca gtg gat ggg aca agg gac agg agc gac cag cac att 336

Pro Asp Gly Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile

100

105

110

cag ctg cag ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt 384

Gln Leu Gln Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser

115

120

125

acc gag act ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac 432

Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr

130

135

140

ggc tca cag aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag 480

Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu

145

150

155

160

gag aac cat tac aac acc tat ata tcc aag aag cat gca gag aag aat 528

Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn

165

170

175

tgg ttt gtt ggc ctc aag aag aat ggg agc tgc aaa cgc ggt cct cgg 576

Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg

180

185

190

act cac tat ggc cag aaa gca atc ttg ttt ctc ccc ctg cca gtc tct 624

Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser

195

200

205

tct gat

630

Ser Asp

210

<210> 29

<211> 180

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of mouse fibroblast growth factor 6,

a part of human fibroblast growth factor 1 and an artificial

sequence

<400> 29

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1

5

10

15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20

25

30

Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35

40

45

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50

55

60

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65

70

75

80

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85

90

95

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100

105

110

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn Ala

115

120

125

Thr Pro Ala Pro His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu

130

135

140

Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly

145

150

155

160

Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro

165

170

175

Val Ser Ser Asp

180



<210> 30

<211> 540

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of  
sequence for a part of mouse fibroblast growth factor 6,  
a part of human fibroblast growth factor 1 and an artificial  
sequence

<220>

<221> CDS

<222> (1)..(540)

<400> 30

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val

1 5 10 15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20 25 30

cgc gcc aac ggc acg cta ctg gac gct aat tac aag aag ccc aaa ctc 144

Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35 40 45

ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc 192

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50

55

60

aca gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag 240

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65

70

75

80

ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act 288

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85

90

95

ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag 336

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100

105

110

aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac gct 384

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn Ala

115

120

125

act cca gct cca cat tac aac acc tat ata tcc aag aag cat gca gag 432

Thr Pro Ala Pro His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu

130

135

140

aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc tgc aaa cgc ggt 480

Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly

145

150

155

160

cct cgg act cac tat ggc cag aaa gca atc ttg ttt ctc ccc ctg cca 528

Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro

165

170

175

gtc tct tct gat

540

Val Ser Ser Asp

180

<210> 31

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 31

aacaaaaagct gggtaccggg

20